

RECLAMATION

Managing Water in the West

Bureau of Reclamation

GIS on Lake Mead

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Working Group
May 14, 2015



U.S. Department of the Interior
Bureau of Reclamation

Area of Interest



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Area of Interest



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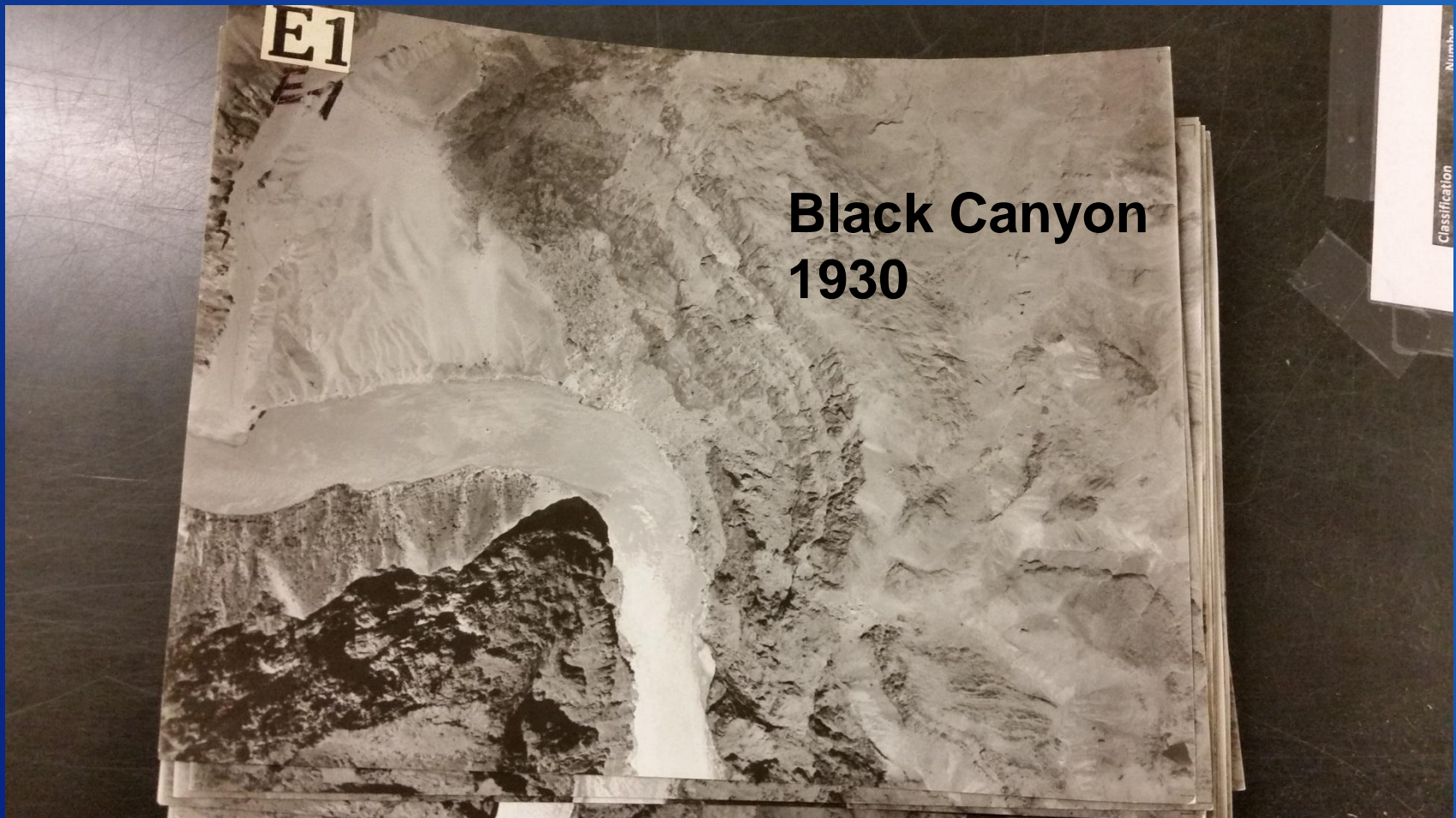
Photographic Library



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Photographic Library

1926 - present



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Multi Species Conservation Program

www.lcrmscp.gov

The screenshot shows the homepage of the Lower Colorado River Multi-Species Conservation Program (LCRMSCP) website. The browser window has two tabs: 'pic - kzander@usbr.gov' and 'Lower Colorado River Multi-Species Conservation Program'. The address bar shows 'www.lcrmscp.gov'. The website features a header with a landscape image and the program's name, 'Lower Colorado River Multi-Species Conservation Program', with the tagline 'Balancing Resource Use and Conservation'. Below the header is a navigation menu with links to HOME, SPECIES, CONSERVATION AREAS, and STEERING COMMITTEE. A search bar is located on the left side of the page. A large image of a cotton rat is featured in the center, with the caption 'First Colorado River Cotton Rat found in Southern Nevada since 1961, March 2012 - Photo by [unintelligible]'. Below the image are three columns of news items: RESTORATION, WILDLIFE, and FISHERIES. The RESTORATION column mentions a draft implementation report for FY 2016. The WILDLIFE column mentions biologists completing the 13th season of summer bird banding. The FISHERIES column mentions ASU students gaining hands-on experience with native fish conservation at Lake Havasu. The footer of the website contains a list of links: Home, Conservation, Species, Quality, Watersheds, Projects, Partners, Publications, and Contact Us. The system clock in the bottom right corner shows 9:46 AM on 5/14/2015.

Lower Colorado River
Multi-Species Conservation Program
Balancing Resource Use and Conservation

HOME SPECIES CONSERVATION AREAS STEERING COMMITTEE

Search

Text Size A A

1 / 19 First Colorado River Cotton Rat found in Southern Nevada since 1961, March 2012 - Photo by [unintelligible]

What's New!

Draft Implementation Report, FY 2016 Workplan and Budget, FY 2014 Accomplishment Report

RESTORATION

Youth Conservation Corps completes 80 hour 'spike' clearing invasive salt cedar at Big Bend Conservation Area

The Lower Colorado River Multi-Species Conservation Program (LCRMSCP) recently partnered with the Nevada Conservation Corps, based in Las Vegas, to remove invasive salt cedar at Big Bend Conservation Area, near Laughlin for fuels reduction to protect the nearby area from fire risks.

WILDLIFE

Biologists Complete 13th Season of Summer Bird Banding along Lower Colorado River

"It's great to see all of the birds that show up to a restoration site, within just a few years after planting." Those words reflect just a small portion of the sense of satisfaction Wildlife Biologist Chris Dodge experienced at the conclusion of this summer's bird banding along the lower Colorado River.

FISHERIES

ASU Students Gain Hands-on Experience with Native Fish Conservation at Lake Havasu

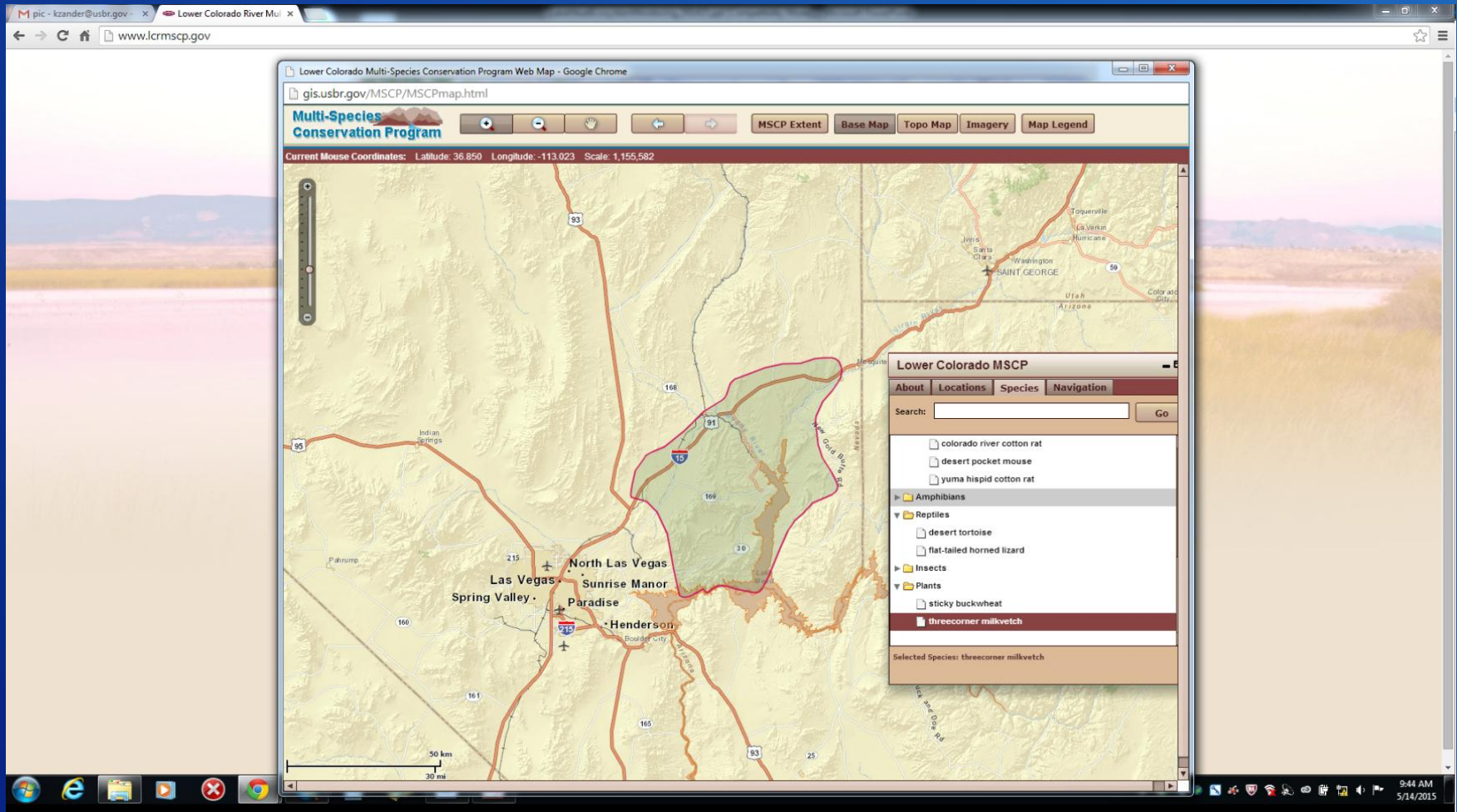
Five students from Arizona State University Colleges at Lake Havasu City got up close and personal with endangered fish conservation efforts during this year's "razorback roundup" on Lake Havasu. Lake Havasu is home to three native Colorado River fish, including the razorback sucker, bonytail, and the flannelmouth sucker.

RESTORATION WILDLIFE FISHERIES

9:46 AM 5/14/2015

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Multi Species Conservation Plan



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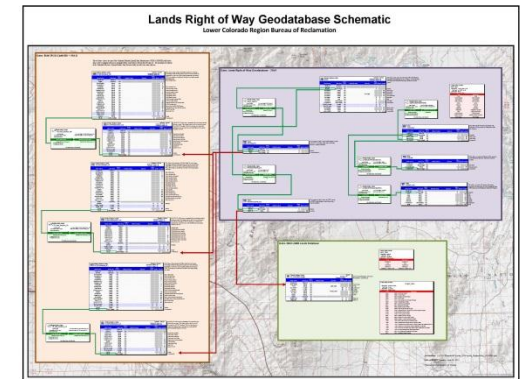
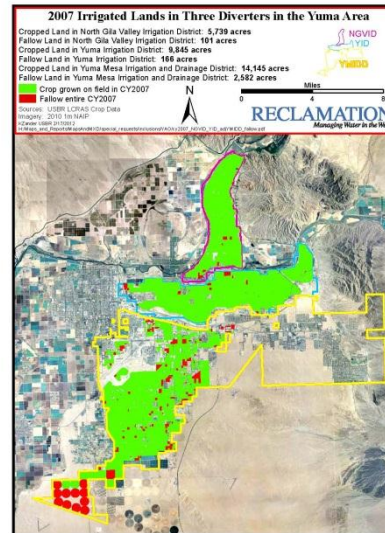
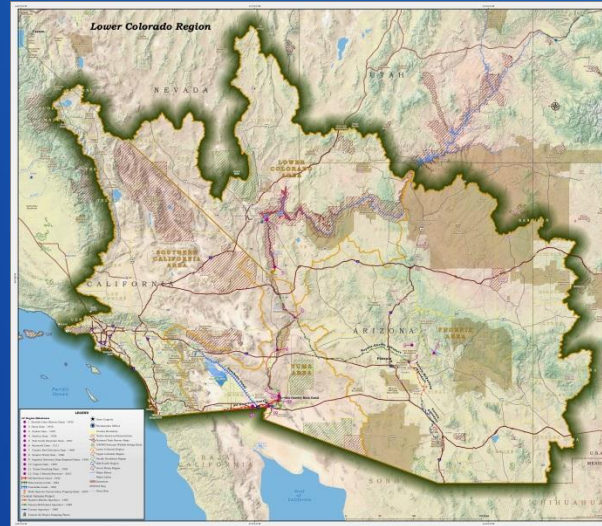
Data GIS creates and maintains

- **Lands**
 - Realty, contracts, recreation
- **Archeological**
- **Biological**
- **Facilities**
- **Agricultural**
- **Imagery**
- **Water resources**
 - Delivery, consumptive uses and losses, capacity, accounting

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Products

- Maps
- Database design
- Analysis
 - Remote sensing, Image and geographic
- Contract oversight
- GIS and GPS support



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Lake Mead Bathymetry

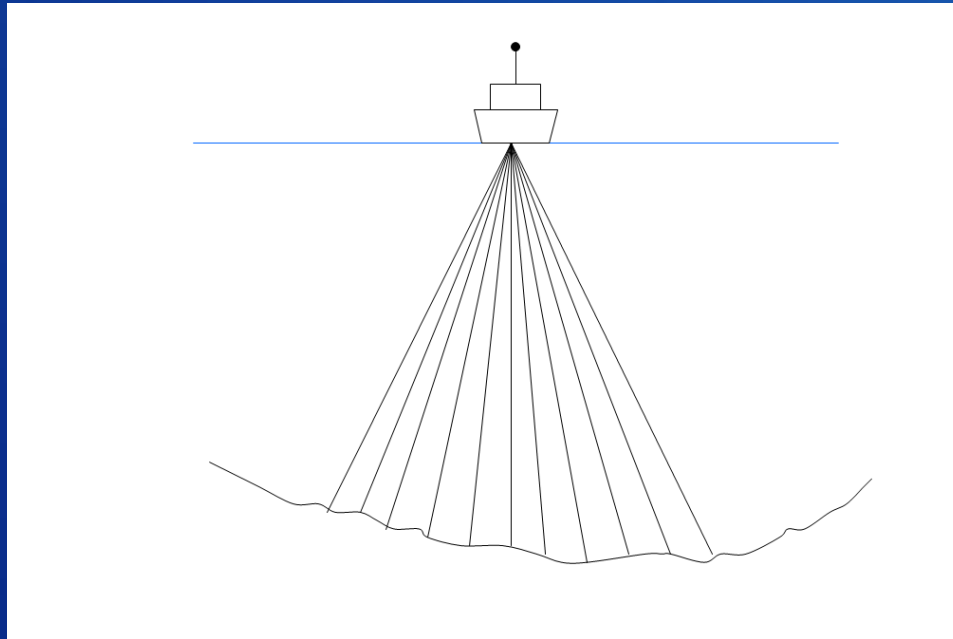
- **Purpose of Study:**
 - To determine the amount and location of sediment that has collected in Lake Mead since 1935.
 - Compare quantities of sediment from 2001 study and 1963 – 1964 study.
- **Background**
 - 1935 - Closure of Hoover Dam
 - 1948 thru 1949 – First Sediment Study of Lake Mead
 - 1963 thru 1964 – Second Sediment Study of Lake Mead (conducted after the closure of Glen Canyon Dam).

Lake Mead Bathymetry

- Pre-impoundment contours and data from the 1963-1964 study were used to determine original bottom surface of Lake Mead.
- Completed using multi-beam mapping system in deep areas of lake, and single-beam mapping in the shallow areas.
 - Multi-beam is good for collecting x, y, z coordinates for depths ranging from 3 meters (9 feet) to 150 meters (490 feet).

Lake Mead Bathymetry

- **Multi-beam system capable of sending out 80 beams giving coverage of 120 degrees below the boat.**



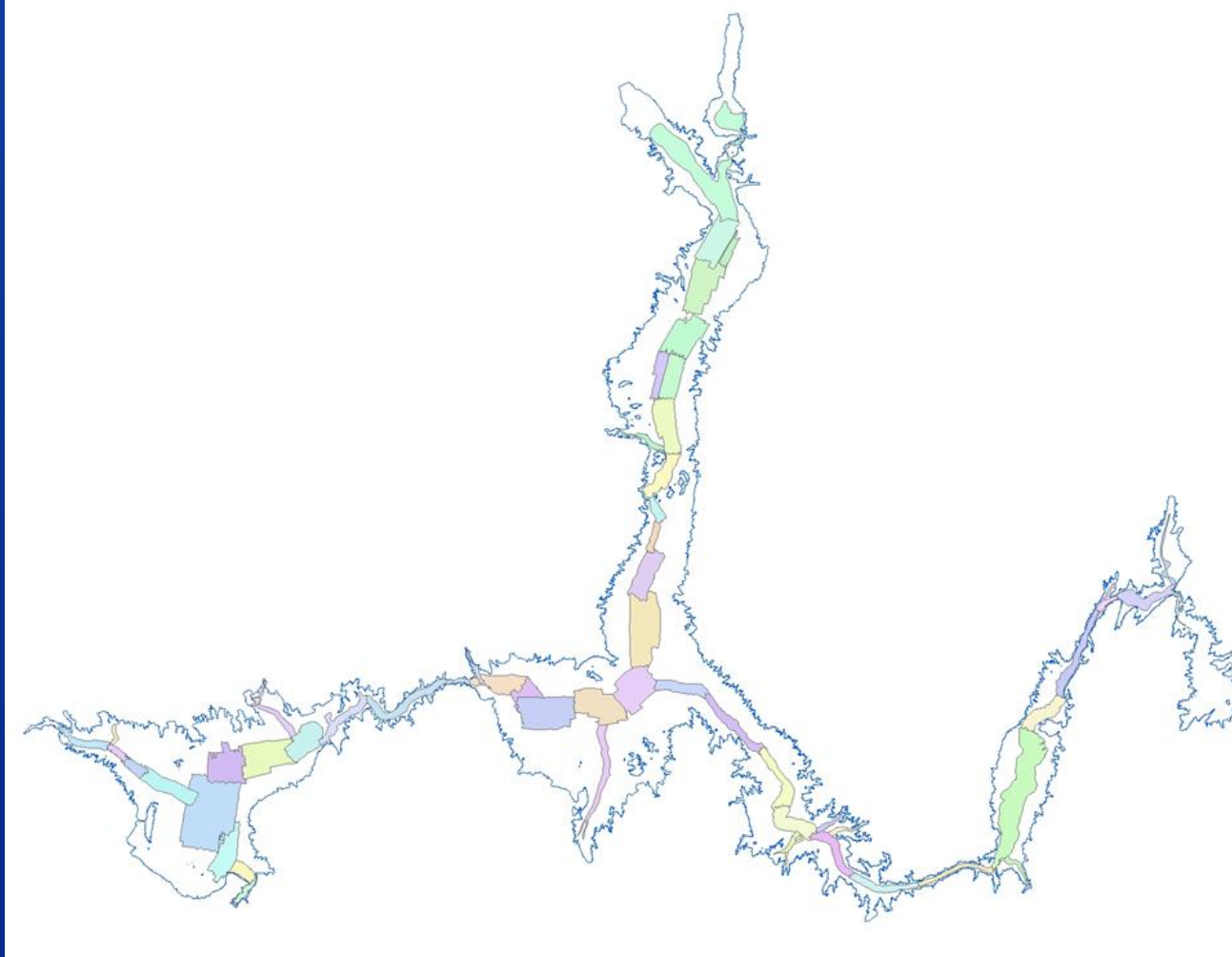
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Lake Mead Bathymetry

- **Data Collection**

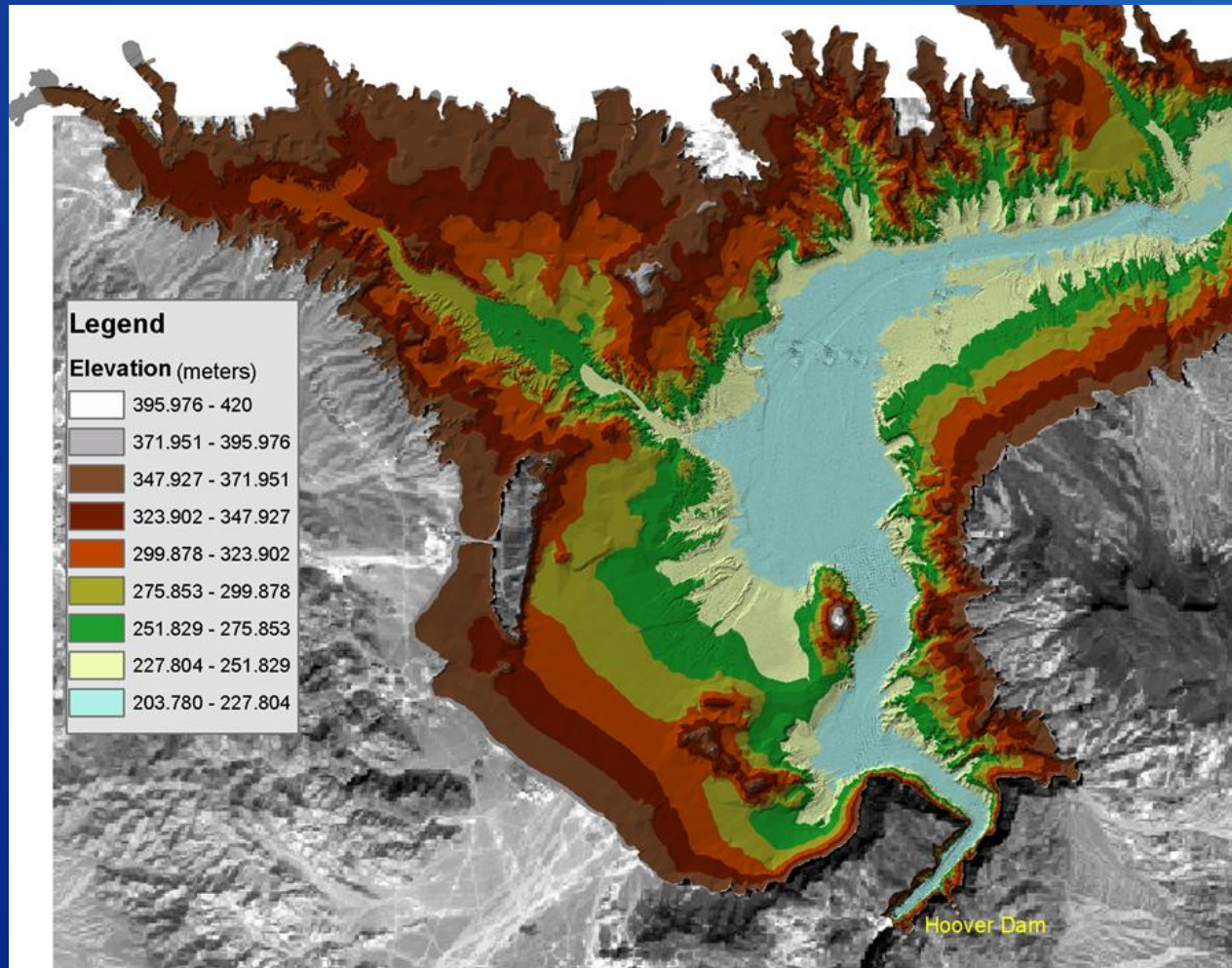
- Our goal for data collection was to collect data in the original river channel from Hoover Dam as far up river as we could navigate. (It is hypothesized that sediment will collect primarily along the original river channel). We also collected data from the major tributaries and washes.
- Our 53 data sets consist of over 20 million points that cover about 30 percent of Lake Mead up to Pearce Ferry. Data processed to 5 meter grids.

Lake Mead Bathymetry



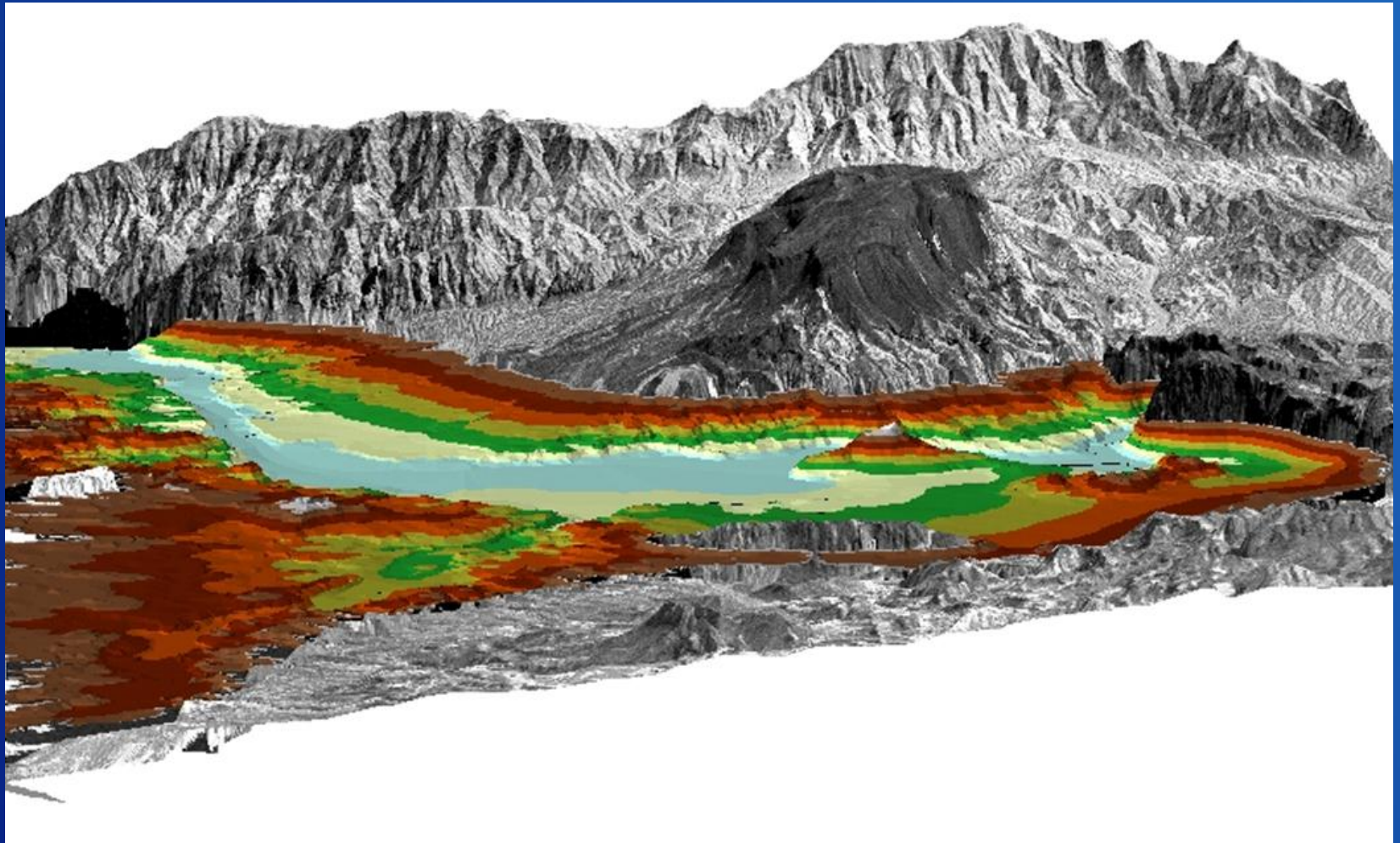
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Lake Mead Bathymetry



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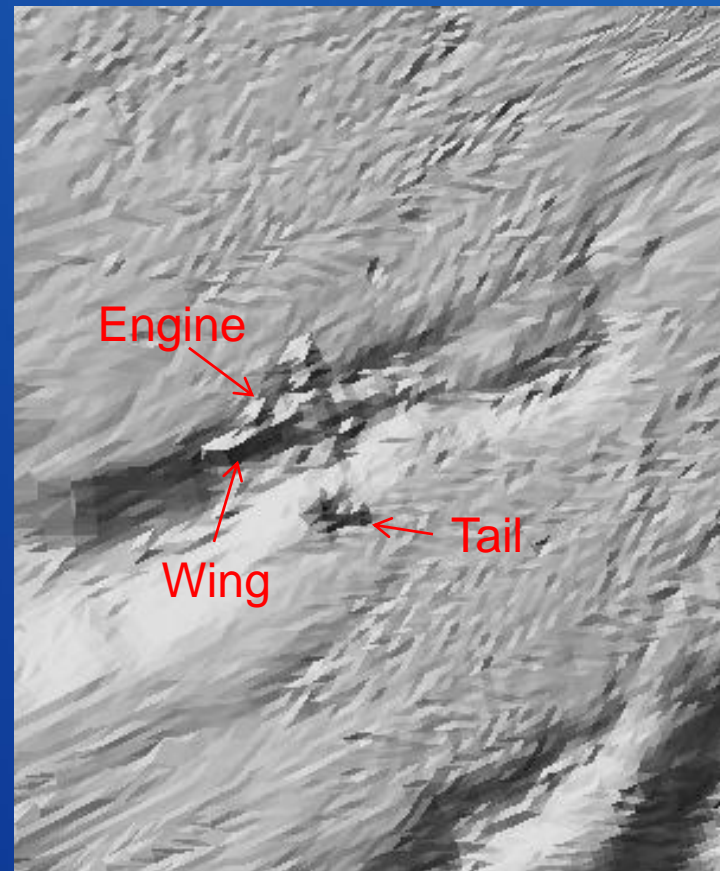
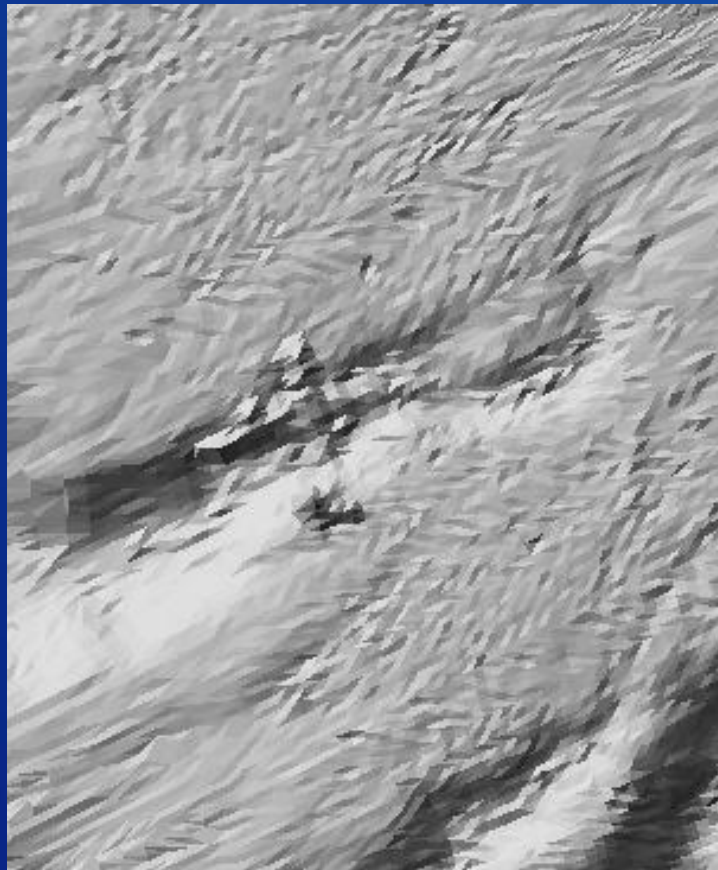
Lake Mead Bathymetry



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Lake Mead Bathymetry

- B-29 Found using unfiltered data sets



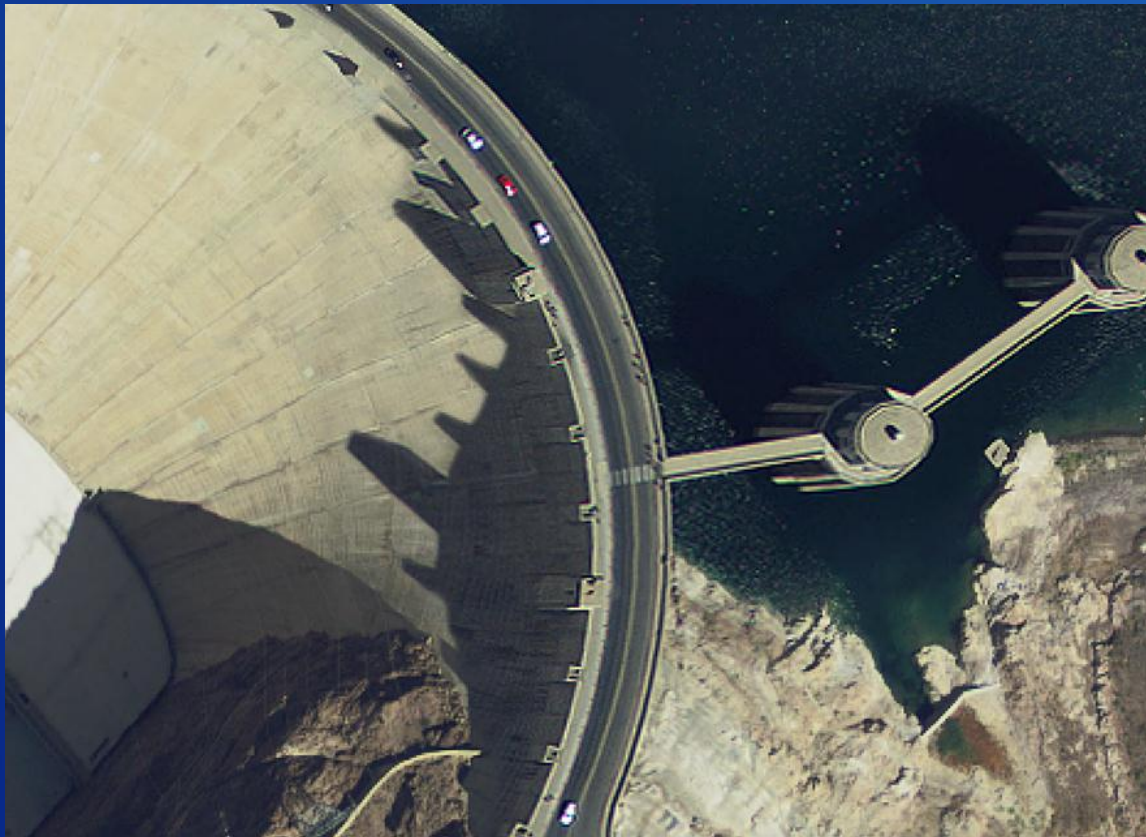
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Lake Mead LiDAR

- Fly LIDAR for the exposed shoreline of Lake Mead – up to Elevation 1220 ft. (lake elevation at time of flight was 1096.1 ft.).
- Deliverables received from project:
 - High-resolution aerial photos of Lake Mead
 - Contours at one foot intervals
 - 1 Meter Grids (a point on the ground on grid spacing of 1 meter – 3.28 feet)
 - 3 Meter Grids

Lake Mead LiDAR

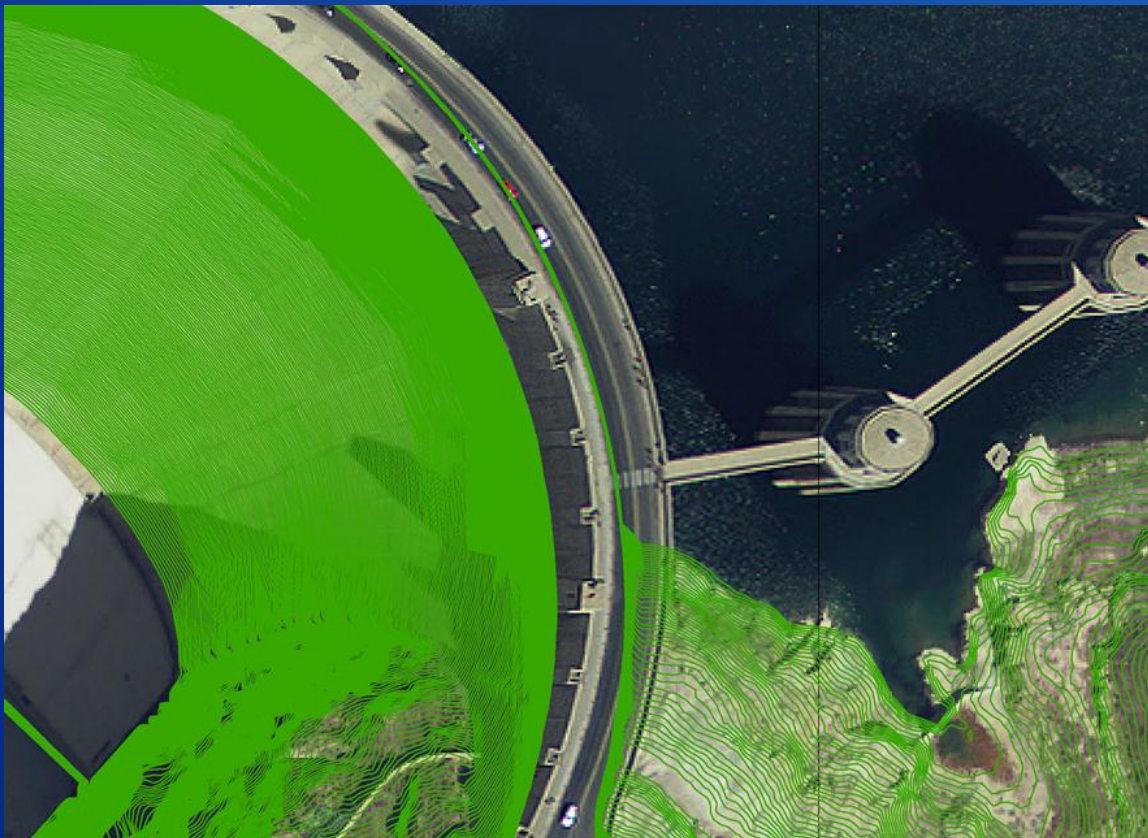
Sample Imagery



RECLAMATION

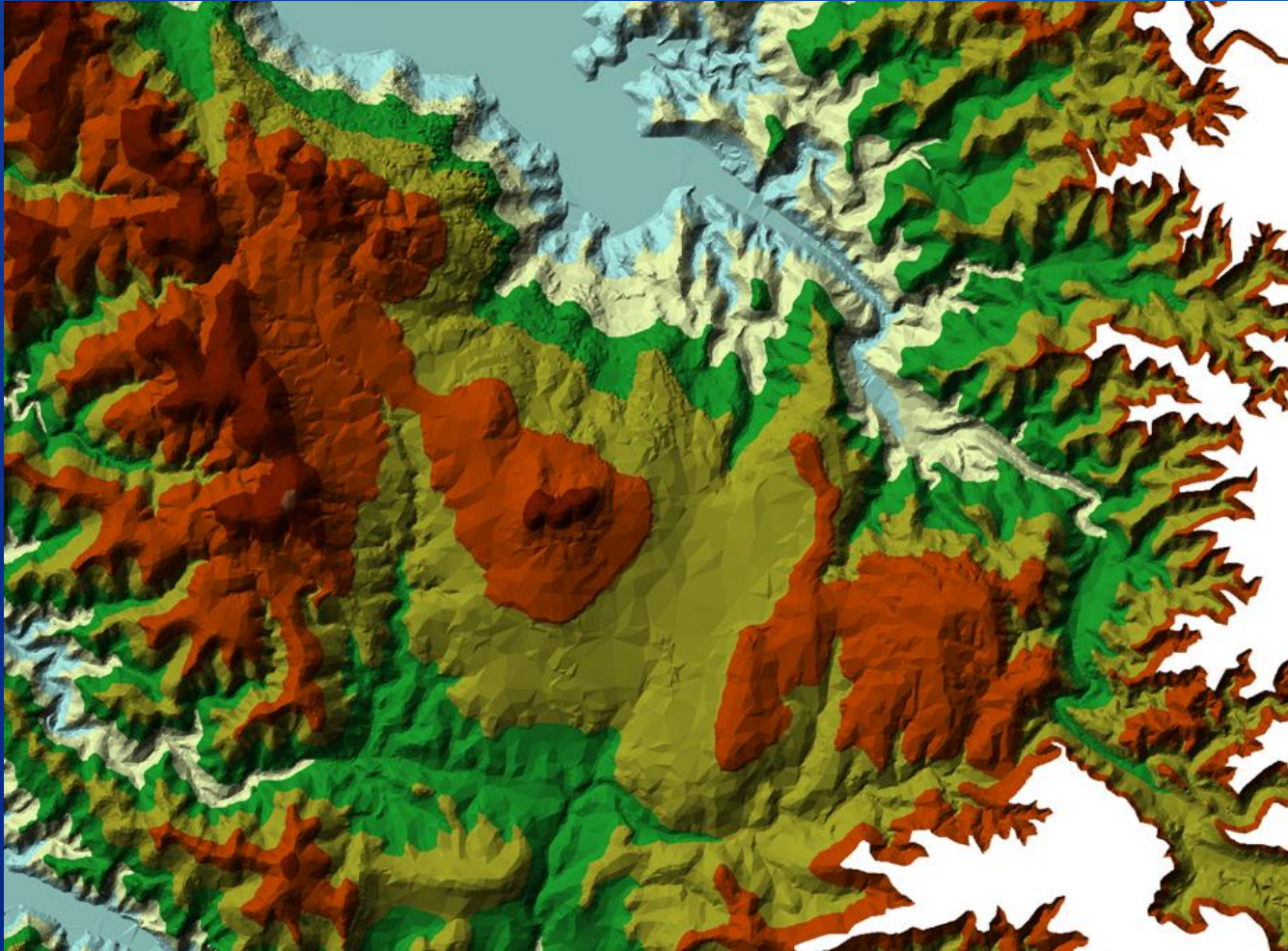
Lake Mead LiDAR

Sample 1' Contours



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Lake Mead LiDAR



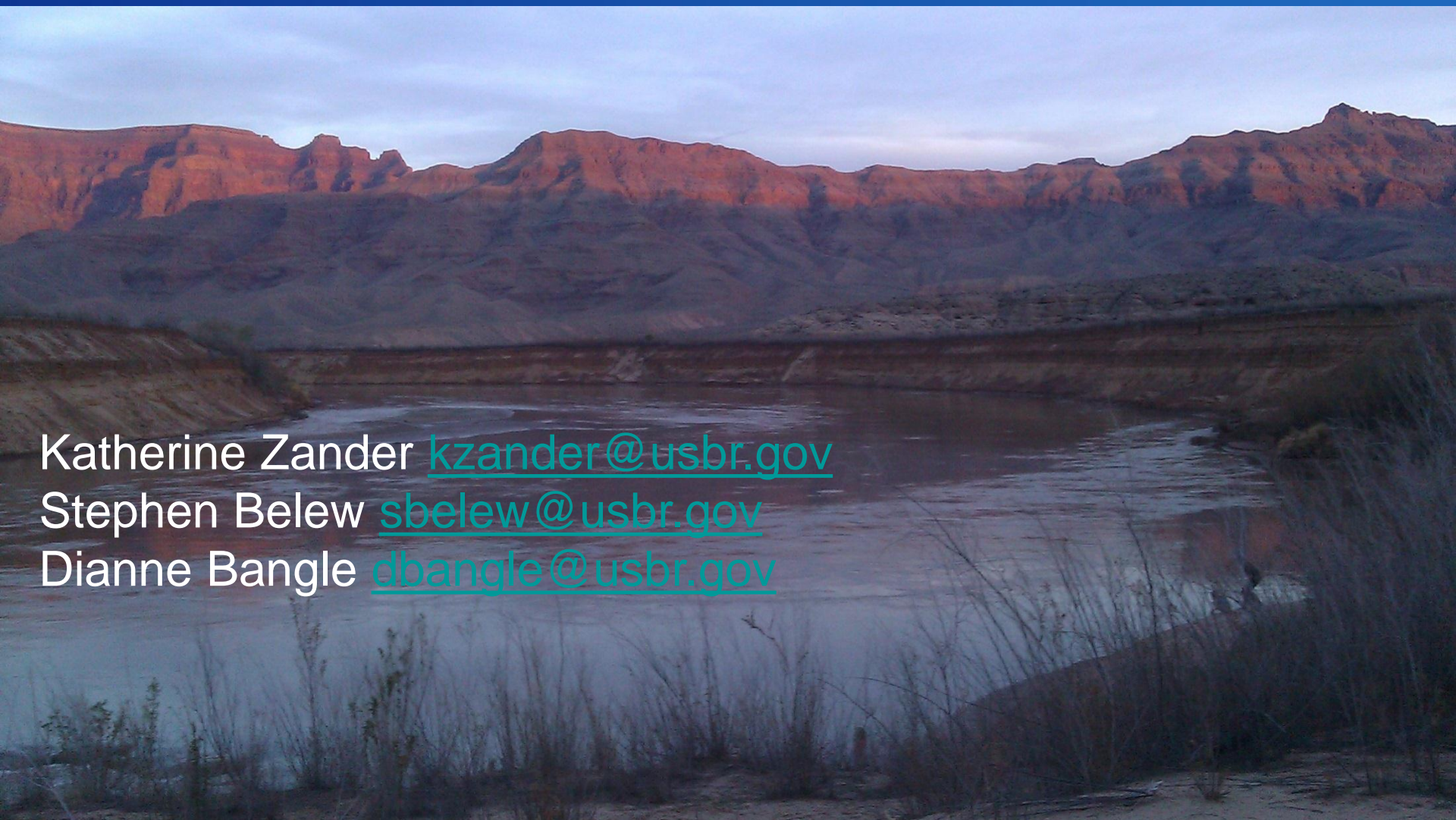
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Lake Mead Area / Volume Tables

Data from both the LiDAR and Bathymetry projects were combined to determine new area – volume tables for Lake Mead.

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Questions?



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